Notice of Allowability	Application No.	Applicant(s)	
	10/668,721	HAAHR ET AL.	
	Examiner	Art Unit	
	MONICA PYO	2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE filed on 6/23/2011*.

2. ☒ The allowed claim(s) is/are *79, 81-86, 88-96, 98-103, 105-115, 118-119, 123-133 135-140* .

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 6/23/11
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20110727* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Apu M Mofiz/
Supervisory Patent Examiner, Art Unit 2161

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 6/23/2011 has been entered.

2. Claims 79, 81-86, 88-96, 98-103, 105-115, 118-119, 123-133 135-140 are currently pending in this Office Action.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms. Meagan Walling on 7/26/2011.

4. The application has been amended as follows in view of expediting allowances:

IN THE CLAIMS:

A. Cancel claims 87, 104 and 134.

B. Change claims 88-89, 105-106, 115 and 135-136 as follows:

(1). In claim 88, line 1, "claim 87" is changed to --claim 79--.

(2). In claim 89, line 1, "claim 87" is changed to --claim 79--.

(3). In claim 105, line 1, "claim 104" is changed to --claim 96--.

(4). In claim 106, line 1, "claim 104" is changed to --claim 96--.

(5). In claim 115, line 1, "(currently amended)" is changed to --(previously presented)--.

(6). In claim 135, line 1, "claim 134" is changed to --claim 127--.

(7). In claim 136, line 1, "claim 134" is changed to --claim 127--.

C. Rewrite claims 79, 91, 94-96, 108, 111-112, 127 and 138 as follows:

Claim 79. (Currently Amended) A method, performed by one or more server devices, the method comprising:

storing, in a memory of the one or more server devices, search query-search document associations, each search query-search document association representing a one-to-one pairing of an issued search query and a search document retrieved based on the issued search query;

receiving, by one or more processors of the one or more server devices, a search query;

identifying, by one or more processors of the one or more server devices, a set of search result documents using the received search query;

forming, by one or more processors of the one or more server devices, a plurality of clusters of search documents, of the stored search query-search document associations, that match the identified set of search result documents;

selecting, by one or more processors of the one or more server devices, at least one of the plurality of clusters;

computing, by one or more processors of the one or more server devices, a centroid for each of the selected at least one of the plurality of clusters;

computing, by one or more processors of the one or more server devices, a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; [[and]]

formulating, by one or more processors of the one or more server devices, a search query refinement suggestion based on the computed scores ~~an issued search query of a search query-search document association associated with a search document of the selected at least one of the plurality of clusters~~; and

sorting, by one or more processors of the one or more server devices, the formulated search query refinement suggestion among a group of search query refinement suggestions.

Claim 91. (Currently Amended) The method of claim 90, where the sorting the formulated search query refinement suggestion ~~formulating the search query refinement suggestion~~ further comprises:

sorting the formulated ~~obtained~~ search query refinement suggestion among [[a]] the group of search query refinement suggestions based on a relevance score assigned to each of the search result documents corresponding to the identified search documents associated with the named clusters and a number of the identified search documents in the named clusters to obtain a sorted set of search query refinement suggestions.

Claim 94. (Currently Amended) A system comprising:

means for storing search query-search document associations in a memory, each search query-search document association representing a one-to-one pairing of a stored search query and a search document retrieved based on the stored search query;

means for receiving a search query;

means for identifying a set of search result documents using the received search query;

means for forming a plurality of clusters of search documents, of the search query-search document associations, that are associated with the identified set of search result documents;

means for selecting at least one of the plurality of clusters;

means for computing a centroid for each of the selected at least one of the plurality of clusters;

means for computing a score for each unique stored search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid;

[[and]]

means for formulating a search query refinement suggestion based on the computed scores ~~a stored search query associated with a search document of the selected at least one of the plurality of clusters~~; and

means for sorting the formulated search query refinement suggestion among a group of search query refinement suggestions.

Claim 95. (Currently Amended) A computer-readable memory device to store instructions executable by at least one processor to cause the at least one processor to:

store search query-search document associations, each search query-search document association representing a one-to-one pairing of an issued search query and a search document retrieved based on the issued search query;

receive a search query;

identify a set of search result documents using the received search query;

form a plurality of clusters of search documents, of the stored search query-search document associations, that are associated with the identified set of search result documents;

select at least one of the plurality of clusters;

compute a centroid for each of the selected at least one of the plurality of clusters;

compute a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; [[and]

formulate a search query refinement suggestion based on the computed scores ~~an issued search query associated with a search document of the selected at least one of the plurality of clusters~~; and

sort the formulated search query refinement suggestion among a group of search query refinement suggestions.

Claim 96. (Currently Amended) A method, performed by one or more server devices, the method comprising:

storing, in a memory of the one or more server devices, a plurality of query-document associations, each query-document association including a one-to-one pairing of an issued search query and a stored search document that was retrieved based on the issued search query;

receiving, by one or more processors of the one or more server devices, a search query from a client device;

identifying, by one or more processors of the one or more server devices, a set of search result documents using the received search query;

identifying, by one or more processors of the one or more server devices, search result documents in the identified set of search result documents that match stored search documents;

forming, by one or more processors of the one or more server devices, a plurality of clusters of the search documents, of the stored plurality of query-document associations, that match the search result documents;

selecting, by one or more processors of the one or more server devices, at least one of the plurality of clusters;

computing, by one or more processors of the one or more server devices, a centroid for each of the selected at least one of the plurality of clusters;

computing, by one or more processors of the one or more server devices, a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid;

identifying, by one or more processors of the one or more server devices, for a stored search document of the selected at least one of the plurality of clusters, a query-document association in the plurality of query-document associations based on the computed scores;

[[and]]

formulating, by one or more processors of the one or more server devices, a search query refinement suggestion for the received search query based on an issued search query of the identified query-document association; and

sorting, by one or more processors of the one or more sever devices, the formulated search query refinement suggestion among a group of search query refinement suggestions.

Claim 108. (Currently Amended) The method of claim 107, where the sorting the formulated ~~formulating~~ the search query refinement suggestion further comprises:

sorting the formulated ~~obtained~~ search query refinement suggestions based on a relevance score assigned to each of the search result documents corresponding to the search documents in the query-document associations associated with the named clusters and a number of the search documents in the named clusters.

Claim 111. (Currently Amended) A system comprising:

means for storing a plurality of query-document associations, each query-document association including a one-to-one pairing of a search query and a search document retrieved based on the search query;

means for receiving a search query;

means for identifying a set of search result documents using the received search query;

means for identifying search result documents in the identified set of search result documents that match one or more of the stored search documents;

means for forming a plurality of clusters based on the stored search documents that match search result documents in the identified set of search result documents;

means for selecting at least one of the plurality of clusters;

means for computing a centroid for each of the selected at least one of the plurality of clusters;

means for computing a score for each unique stored search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid;

means for identifying, for a search result document of the selected at least one of the plurality of clusters, a search query of a query-document association of the plurality of query-document associations that corresponds to the identified search result document based on the computed scores; [[and]]

means for formulating a search query refinement suggestion for the received search query based on the identified search query, and

means for sorting the formulated search query refinement suggestion among a group of search query refinement suggestions.

Claim 112. (Currently Amended) A method, performed by one or more server devices, the method comprising:

creating, by one or more processors of the one or more server devices, a query source reference, including:

identifying, by one or more processors of the one or more server devices, associations between issued search queries and retrieved search documents in a one-to-one relation, and

assigning, by one or more processors of the one or more server devices, a weight to each of the associations;

receiving, by one or more processors of the one or more server devices, a search query;

forming, by one or more processors of the one or more server devices, a plurality of clusters based on the query source reference;

selecting, by one or more processors of the one or more server devices, at least one of the plurality of clusters;

computing, by one or more processors of the one or more server devices, a centroid for each of the selected at least one of the plurality of clusters;

computing, by one or more processors of the one or more server devices, a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; [[and]]

formulating, by one or more processors of the one or more server devices, a refinement suggestion for the received search query based on the computed scores ~~using the at least one of the plurality of clusters~~; and

sorting, by one or more processors of the one or more server devices, the formulated search query refinement suggestion among a group of search query refinement suggestions.

Claim 127. (Currently Amended) A system comprising:

a memory; and

a processor to:

store, in the memory, search query-search document associations, each search query-search document association representing a one-to-one pairing of an issued search query and a search document retrieved based on the issued search query;

receive a search query;

identify a set of search result documents using the received search query;

form a plurality of clusters of search documents, of the stored search query-search document associations, that match the identified set of search result documents;

select at least one of the plurality of clusters;

compute a centroid for each of the selected at least one of the plurality of clusters;

compute a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; [[and]]

formulate a search query refinement suggestion based on the scores ~~an issued search query of a search query-search document association associated with a search document of the selected at least one of the plurality of clusters~~; and

sort the formulated search query refinement suggestion among a group of search query refinement suggestions.

Claim 138. (Currently Amended) The system of claim 137, where, when sorting ~~formulating~~ the formulated search query refinement suggestion, the processor is further to:

sort the formulated ~~obtained~~ search query refinement suggestion among a group of search query refinement suggestions based on a relevance score assigned to each of the search result documents corresponding to the identified search documents associated with the named clusters

and a number of the identified search documents in the named clusters to obtain a sorted set of search query refinement suggestions.

Allowable Subject Matter

5. Claims 79, 81-86, 88-96, 98-103, 105-115, 118-119, 123-133, 135-140 are allowed.

6. The following is an examiner's statement of reasons for allowance:

Regarding claims 79, 81-86 and 88-93, the prior art fails to disclose or make obvious a method, performed by one or more server devices comprising, in addition to the other recited features of the claim, the steps of storing search query-search document associations, each search query-search document association representing a one-to-one pairing of an issued search query and a search document retrieved based on the issued search query; receiving a search query; identifying a set of search result documents using the received search query; forming, by one or more processors of the one or more server devices, a plurality of clusters of search documents, of the stored search query-search document associations, that match the identified set of search result documents; selecting at least one of the plurality of clusters; computing a centroid for each of the selected at least one of the plurality of clusters; computing a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; and formulating a search query refinement suggested based on the computed scores; and sorting the formulated search query refinement suggestion among a group of search query refinement suggestions in the manner recited in claim 79.

Regarding claims 94 and 123-124, the prior art fails to disclose or make obvious a system comprising, in addition to the other recited features of the claim, means for storing search query-

search document association in a memory, each search query-search document association representing a one-to-one pairing of a stored search query and a search document retrieved based on the stored search query; means for receiving a search query; means for identifying a set of search result documents using the received search query; means for forming a plurality of clusters of search documents, of the search query-search document associations, that are associated with the identified set of search result documents; means for selecting at least one of the plurality of clusters; means for computing a centroid for each of the selected at least one of the plurality of clusters; means for computing a score for each unique stored search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; and means for formulating a refinement suggestion based on the computed scores; and means for sorting the formulated search query refinement suggestion among a group of search query refinement suggestions in the manner recited in claim 94.

Regarding claims 95 and 118-119, the prior art fails to disclose or make obvious a computer-readable memory device to store instructions executable by at least one processor to cause the at least one processor to, in addition to other recited features of the claim, store search query-search document association, each search query-search document association representing a one-to-one pairing of an issued search query and a search document retrieved based on the issued search query; receive a search query; identify a set of search result documents using the received search query; form a plurality of clusters of search documents, of the stored search query-search document associations, that are associated with the identified set of search result documents; select at least one of the plurality of clusters; and compute a centroid for each of the selected at least one of the plurality of clusters; compute a score for each unique issued search

query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; formulate a search query refinement suggestion based on the computed scores; and sort the formulated search query refinement suggestion among a group of search query refinement suggestions in the manner recited in claim 95.

Regarding claims 96 and 98-103, 105-110, the prior art fails to disclose or make obvious a method comprising, in addition to other recited features of the claim, the steps of storing, in a memory of the one or more server device, a plurality of query-document associations, each query-document association including a one-to-one pairing of an issued search query and a stored search document that was retrieved based on the issued search query; receiving a search query; identifying a set of search result documents using the received search query; identifying search result documents that match stored search documents; forming a plurality of clusters of the search documents, of the stored plurality of query-document associations, that match the search result documents; selecting at least one of the plurality of clusters, identifying for a stored search document; computing a centroid for each of the selected at least one of the plurality of clusters; computing a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; identifying for a stored search document of the selected at least one of the plurality of clusters, a query-document association in the plurality of query-document associations based on the computed scores; formulating a search query refinement suggestion for the received search query based on an issued search query of the identified query-document association; and sorting the formulated search query refinement suggestion among a group of search query refinement suggestions in the manner recited in claim 96.

Regarding claims 111 and 125-126, the prior art fails to disclose or make obvious a system comprising, in addition to other recited features of the claim, means for storing a plurality of query-document associations, each query-document association including a one-to-one pairing of a search query and a search document retrieved based on the search query; the recited receiving means; means for identifying a set of search result documents using the received search query; means for identifying search result documents in the identified set of search result documents that match one or more of the stored search documents; means for forming a plurality of clusters based on the stored search documents that match search result documents in the identified set of search result documents; means for selecting at least of the plurality of clusters; means for computing a centroid for each of the selected at least one of the plurality of clusters; means for computing a score for each unique stored search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; means for identifying a search document of the selected at least one of the plurality of clusters, a search query of a query-document association of the plurality of query-document associations that corresponds to the identified search result document based on the computed scores; means for formulating a search query refinement suggestion for the received search query based on the identified search query; and means for sorting the formulated query refinement suggestion among a group of search query refinement suggestions in the manner recited in claim 111.

Regarding claims 112-115, the prior art fails to disclose or make obvious a method, performed by one or more server devices comprising, in addition to other recited features of the claim, the steps of creating a query source reference, including identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a

weight to each of the associations; receiving a search query; forming a plurality of clusters based on the query source reference; selecting at least one of the plurality of clusters; computing a centroid for each of the selected at least one of the plurality of clusters; computing a score for each unique issued search query associated with a document in the selected clusters based on the computed centroid; formulating a refinement suggestion for the received search query based on the computed scores; and sorting the formulated search query refinement suggestion among a group of search query refinement suggestions in the manner recited in claim 112.

Regarding claims 127-133 and 135-140, the prior art fails to disclose or make obvious a system comprising a memory; and a processor to store search query-search document association, each search query-search document association representing to one-to-one paring of an issued search query and a search document retrieved based on the issued search query; receive a search query; identify a set of search result document; form a plurality of clusters of search documents; select at least one of the plurality of clusters; compute a centroid for each of the selected at least one of the plurality of clusters; compute a score for each unique issued search query associated with a document in the selected at least one of a plurality of clusters based on the computed centroid; formulate a search query refinement suggestion based on the scores; and sort the formulated search query refinement suggestion among a group of search query refinement suggestions in the manner recited in claim 127.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONICA PYO whose telephone number is (571)272-8192. The examiner can normally be reached on Mon- Fri 8:00 - 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Apu Mofiz can be reached on 571-272-4080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Monica M Pyo
Examiner
Art Unit 2161

07/2011

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